Notes on the behaviour, plumage and distribution of the White-tailed Swallow *Hirundo megaensis*

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Notes sur le comportement, le plumage et la distribution de l'Hirondelle à queue blanche *Hirundo megaensis*. L'Hirondelle à queue blanche *Hirundo megaensis* est une espèce menacée et peu connue endémique à l'Éthiopie du sud, où elle est confinée à une petite zone de savane à *Acacia*. En dépit de la pénurie de données antérieures sur la nidification, nous avons trouvé 67 nids en 2010–14, généralement dans des cases villageoises habitées, et nous rapportons les premiers cas confirmés de nidification dans des termitières (deux mentions certaines). Le nid est une petite coupe maçonnée de boue et garnie d'herbes et de poils d'animaux, fixée à une poutrelle circulaire supportant le toit. Il ressemble à celui de son espèce sœur, l'Hirondelle à gorge perlée *H. dimidiata* de l'Afrique autrale, malgré le fait que l'Hirondelle à queue blanche a des pontes plus grandes (3–4 œufs blancs) et niche moins souvent, produisant une nichée dans chacune de ses deux saisons de nidification, qui sont actionnées par les pluies (avril–juin et octobre–novembre). Le même nid est apparemment utilisé en ces deux saisons, probablement par le même couple. L'incubation dure 16–17 jours, certaines nichées comportant des jeunes nettement plus petits, ce qui suggère une éclosion asynchrone. L'examen de jeunes en main et de spécimens de musée a confirmé que les juvéniles peuvent être identifiés par la queue plus courte, la tête et souvent aussi les ailes plus brunes, et le blanc de la queue plus réduit. L'espèce est d'habitude observée seule ou en couple, mais des groupes comprenant jusqu'à 50 individus, parfois mélangés à d'autres hirondelles, peuvent être rencontrés. L'aire de nidification est presque identique à celle du Corbin de Stresemann *Zavattariornis stresemanni*, mais des observations régulières depuis 2005 sur la plaine de Liben, à 120 km à l'est de la zone principale, semblent indiquer que l'Hirondelle à queue blanche y est un visiteur fréquent.

Summary. White-tailed Swallow *Hirundo megaensis* is a threatened and poorly known bird endemic to southern Ethiopia, where it is restricted to a small area of *Acacia* savanna. Despite the paucity of previous nest records, we found 67 nests in the years 2010–14, commonly in occupied village huts, and report the first confirmation of nesting (two certain records) in termite mounds. Its nests are small mud cups lined with grass and animal hair, fixed to roof joists and similar to those of its sister species, Pearl-breasted Swallow *H. dimidiata* of southern Africa, although it appears to lay larger clutches (3–4 pure white eggs) and breed less frequently, producing one brood in each of its two rain-driven breeding seasons (April–June and October–November). The same nests are reportedly used in both seasons, presumably by the same pairs. Incubation lasts 16–17 days, with some broods having clearly smaller chicks and hence presumably asynchronous hatching. Study of nestlings in the hand and museum specimens confirmed that juveniles can be identified by their shorter tails, browner heads and frequently also wings, and reduced white in the tail. Although the species is typically seen singly or in pairs, flocks of up to 50, sometimes mixed with other hirundines, do occur. The breeding range appears to be almost identical to that of Stresemann's (Ethiopian) Bush Crow *Zavattariornis stresemanni* but regular sightings of White-tailed Swallows since 2005 at the Liben Plain, 120 km east of the core area, suggest that the species is a frequent visitor there.

White-tailed Swallow *Hirundo megaensis* is a globally threatened (Vulnerable) species restricted to *c.*5,500 km^2 of *Acacia–Commiphora* savanna woodland around the towns of Yabello and Mega in southern Ethiopia (Benson 1942, Collar & Stuart 1985), with a few recent sightings elsewhere, notably the Liben Plain, 120 km to the east (Gabremichael *et al.* 2009, BirdLife International 2015a). This tiny range largely overlaps with that of Stresemann's (Ethiopian) Bush Crow *Zavattariornis stresemanni* (Endangered), which appears to be limited largely by climate (Donald *et al.* 2012, BirdLife International 2015b). White-tailed Swallow is extremely closely related to Pearl-breasted Swallow *H. dimidiata* of southern Africa, differing in mtDNA by just 0.7%, less than the genetic distance between many subspecies of Barn Swallow *H. rustica* (Dor *et al.* 2010).

White-tailed Swallow was first described to science as recently as 1942, and it was not until

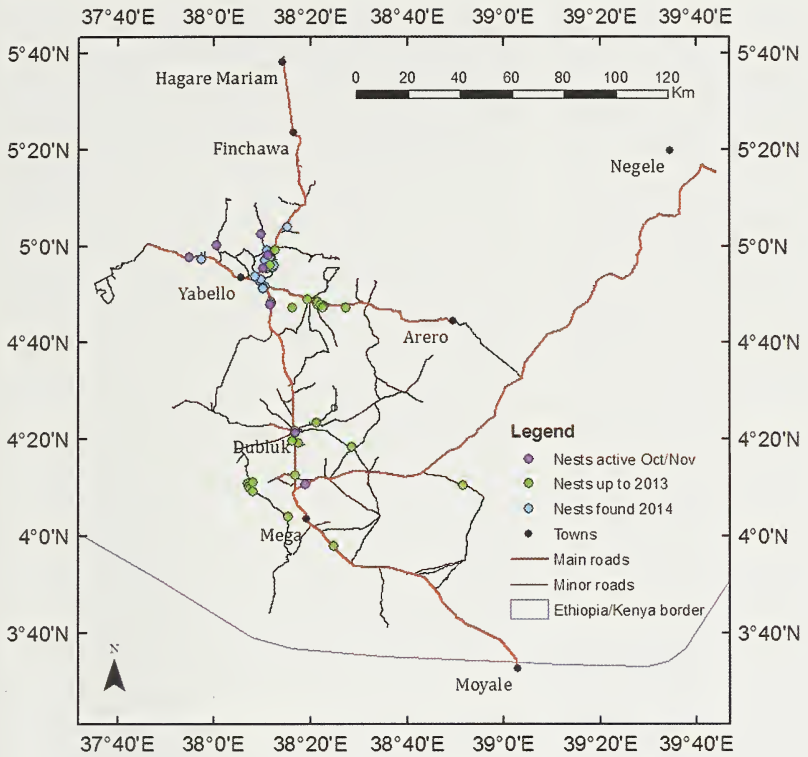

Figure 1. Study region, showing all White-tailed Swallow *Hirundo megaensis* nest records to date. Nests found active in April and May 2014, and in October and November of any year, are highlighted.

Zone d'étude, avec toutes les données de nidification de l'Hirondelle à queue blanche *Hirundo megaensis* recensées jusqu'à présent. Les nids occupés en avril et mai 2014, et en octobre et novembre de n'importe quelle année, sont indiqués.

1996 that its nest was documented (Holtam 1998). Despite, or perhaps because of, its highly restricted distribution, White-tailed Swallow has remained under-studied, with scant information on its abundance, behaviour and habitat preferences (Ash & Gullick 1989, Syvertsen & Dellelegn 1991, Mellanby *et al.* 2008). Over the past ten years we have made numerous visits to the Yabello–Mega region to develop project work on Stresemann's Bush Crow, and in 2010–14 we found a total of 67 nests of White-tailed Swallow (two in 2010, 11 in 2011, nine in 2012, 11 in 2013 and 34 in 2014: Fig. 1). Additionally, we have examined nine specimens at the Natural History Museum, Tring, UK (NHMUK) and one at the Zoological Research Museum Alexander Koenig, Bonn, Germany (ZFMK). Here we document these findings.

Nest locations

Given that Pearl-breasted Swallow breeds in mud huts, wells, animal burrows, buildings, bridges and rock faces (Maclean 1993, Harrison *et al.* 1997), it might have been expected that White-tailed Swallows would utilise a similar breadth of locations. Benson (1946) had suspected breeding occurred in termite mounds, but Holtam (1998) found two nests with chicks in village huts in May, and a third in a deep well in September. In October 2000 a further four nests were reported in culverts under the main (Addis Ababa–Nairobi) road that bisects the species' range, and in October 2001 two pairs were seen frequenting a termite mound, one bird carrying food (Ash & Atkins 2010). However, the observer has clarified that the birds observed at the culvert may not have been the builders of the nests seen, and that the birds at the termite mound may simply have been feeding there (N. Borrow *in litt.* 2008).

Village huts

Traditional Borana huts probably provide the most important nesting sites for White-tailed Swallow. All but two of our 67 recent nests were in traditional Borana domestic huts or their associated store huts, with one nest in 2010 in a termite mound converted into a bread oven (see below) and one in 2013 against wooden beams in an isolated concrete building next to a water storage tank (Fig. 2).

Figure 2. White-tailed Swallow *Hirundo megaensis* nest found in April 2013 in a concrete building. This is the only nest record from a non-traditional building, and it is noticeable that the nest is attached to the wooden beams (perhaps more akin to the sides of a termite mound or the thatching of a traditional hut) rather than to the horizontal corrugated iron roof (Andrew Bladon)

Nid d'Hirondelle à queue blanche *Hirundo megaensis* trouvé en avril 2013 dans un bâtiment en béton. C'est la seule donnée de nidification dans une construction non traditionnelle. Le nid est attaché aux poutrelles en bois (peut-être plus semblables aux parois d'une termitière ou à la toiture d'une case traditionnelle) et non pas au toit horizontal en tôle ondulée (Andrew Bladon)

Figure 3. Traditional Borana huts are important nesting sites for White-tailed Swallow *Hirundo megaensis*; huts number between five and 100 per village and in the best areas, such as on Dida Yabello plain, there may be one or two White-tailed Swallow nests in each village (Andrew Bladon)

Les cases traditionnelles des Boranas sont des sites de nidification importants pour l'Hirondelle à queue blanche *Hirundo megaensis* ; il y a 5–100 cases par village et dans les meilleures zones, telle que la plaine de Dida Yabello, il peut y avoir un ou deux nids d'Hirondelles à queue blanche dans chaque village (Andrew Bladon)

Borana huts are typically small, circular and constructed with wattle-and-daub style mud walls, a single doorway, and a low-pitched conical thatched roof supported by vertical beams and circular thatched joists (Fig. 3). They are 2–6 m in diameter, and 3–5 m in height; domestic huts are generally larger than store huts. Doors (not always present) vary from a loose assembly of large sticks that roughly fill the opening to occasional solid structures with a frame. In all but the last case, access holes large enough for the adult swallows remain even when the door is closed. Occupied huts are usually solid and complete, whilst huts used for storing grain or housing animals are built to the same design but often with only partial daubing or thatching and looser doors, permitting easier access but less protection from the weather.

Both constructions are numerous within villages, store huts accounting for 20–30% of the total number of buildings.

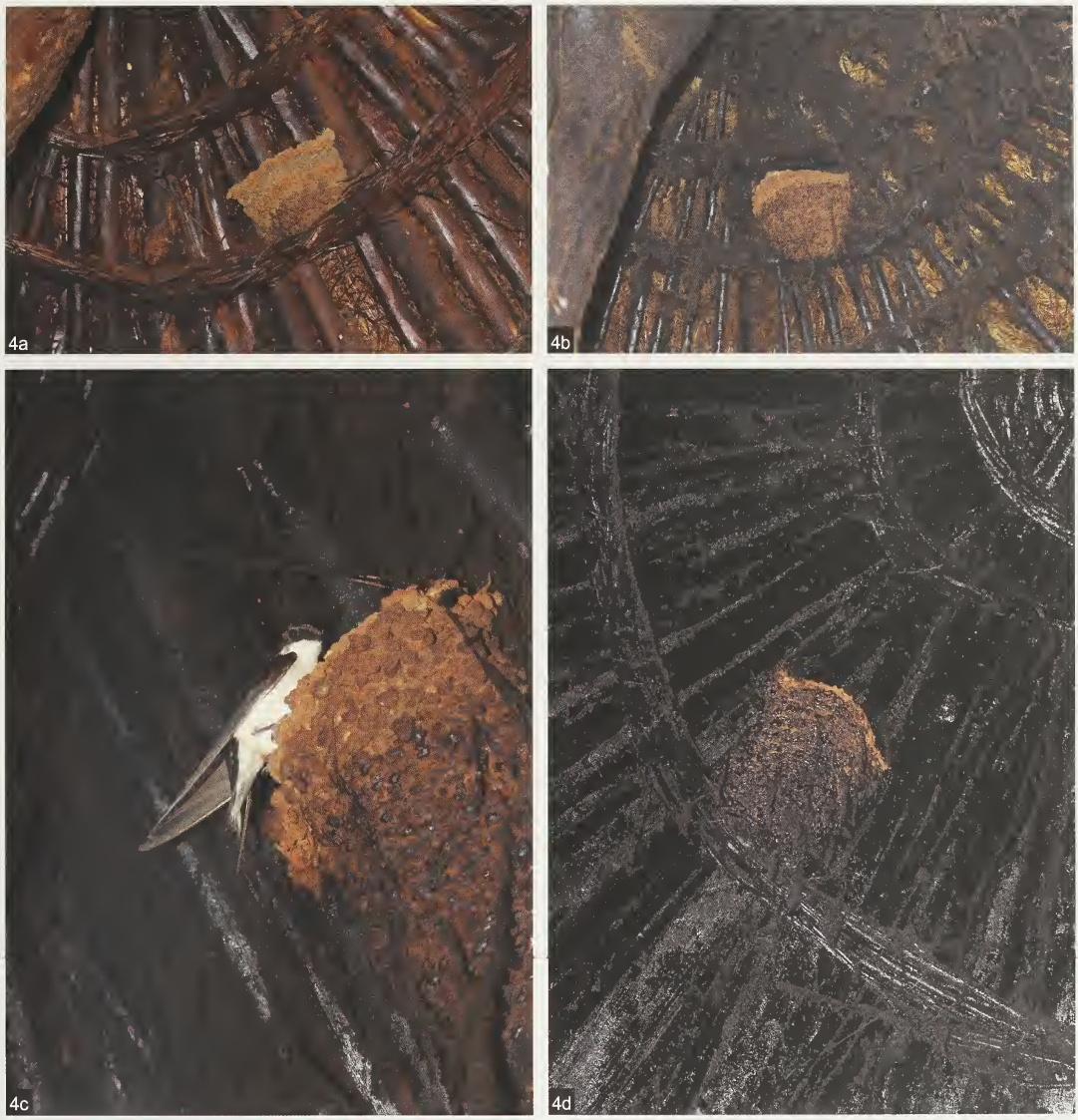

Figure 4. White-tailed Swallow *Hirundo megaensis* nests of different ages: **(a)** new nest in a newer hut with a clean roof; **(b)** old nest with a second layer of paler mud at the top; **(c–d)** older nests (here three and five years old) are deeper in construction, and the lower, older, part is blackened by carbon deposits from the hut's fire. Carbon deposits can also be seen suspended from the ceilings of these huts. This suggests birds re-use nests from year to year, with some new mud being added in later years (Andrew Bladon)

Nids d'Hirondelles à queue blanche *Hirundo megaensis* d'âges différents : **(a)** nouveau nid dans une case relativement neuve avec un toit propre ; **(b)** vieux nid avec une deuxième couche de boue plus pâle ; **(c–d)** les vieux nids (ici de trois et cinq ans) sont plus profonds, et la partie inférieure la plus vieille est noircie par les dépôts de carbone provenant du feu de la case. Des dépôts de carbone sont aussi visibles au plafond de ces cases. Ceci suggère que les hirondelles réutilisent les nids d'année en année et ajoutent chaque année un peu de boue (Andrew Bladon)

White-tailed Swallow nests are cups constructed of mud, typical of the genus *Hirundo*. Depth varies from 60 to 160 mm (n = 28) (Fig. 4), possibly related to the age of the nest (see below). Nests in huts were fixed to the circular joists of the roof, at heights of 2.5–4.5 m (n = 28), normally built within a few joists of the top of the hut. It appears that White-tailed Swallows

Figure 5. White-tailed Swallow *Hirundo megaensis* nest within a termite mound on Soda Plain, Ethiopia, found by a Sunbird tour party in November 2008 (Les Colley / Sunbird)

Nid d'Hirondelle à queue blanche *Hirundo megaensis* à l'intérieur d'une termitière dans la plaine de Soda, Éthiopie, trouvé lors d'un voyage de Sunbird en novembre 2008 (Les Colley / Sunbird)

Figure 6. An old termite mound, previously used as a bread oven by villagers, in which a White-tailed Swallow *Hirundo megaensis* nest was found in June 2010 (Nigel Collar)

Vieille termitière, utilisée auparavant comme four à pain par les villageois, dans laquelle un nid d'Hirondelle à queue blanche *Hirundo megaensis* a été trouvé en juin 2010 (Nigel Collar)

prefer to nest in huts occupied by people (31 nests in 2014), with only a few records from store huts (three in 2014). In contrast, of ten Ethiopian Swallow *H. aethiopica* nests found during the same search in 2014, only two were within occupied huts and eight within store huts, a statistically significant difference ($\chi^2_1 = 20.8$, $P < 0.0001$). This is consistent with observations of Ethiopian Swallow nests in previous years (KG, TT).

Within the core range at the right season (see below) one can walk into a village and ask for 'mana raaree' (swallow nests) and be led straight to one, or at least directed to the next village where one can be found. On the edges of the range, however, for example the three villages where nests were found west of Yabello in 2014, people showed little awareness of the birds and frequently only the owners of the hut that actually contained the nest were conscious of the birds' presence. This is intriguing, as the Borana do not distinguish between species of swallow, 'raaree' being their term for all hirundines or bats, but perhaps it is simply because other species nest less frequently in village huts. The same search effort in 2014 yielded only ten nests of Ethiopian Swallow, suggesting a lower density of birds, while Lesser Striped Swallows *Cecropis abyssinica*, which are common across the region, seem to nest only on concrete structures—local clinics, schools or culverts under the road—and in caves (AJB, KG, TT pers. obs.). Indeed, in the same region west of Yabello, we were regularly pointed towards road culverts when asking for 'raaree', only to find *Cecropis* nests with their distinctive funnel entrance (Winkler & Sheldon 1993).

There is considerable variation in local people's responses to swallow nests in their huts. Those

who identify them as swallows view the nest as a sign of good luck, while those who mistake them for bats report that they destroy the nests because the droppings can cause blindness. These attitudes can be split even within a village, with one lady informing AJB that she had not destroyed the nest despite what her neighbours said, and was glad when the birds produced chicks.

Termite mounds

It is almost 70 years since Benson (1946) suggested that White-tailed Swallow might nest in termite mounds, but little evidence for this ever accumulated. Birds have been seen frequenting them (Collar & Stuart 1985, Borrow 2001), but we can report only three occasions where nests have been suspected or found in them. On 14 November 2007 a pair of swallows was observed entering a 40-cm-wide west-facing ground-level cavity in a 3-m-tall termite mound south of Dubluk, the birds each time remaining inside for >1 minute; to avoid disturbance no attempt was made to investigate further (B., W. & S. Oosterbaan *in litt.* 2010). On 20 November 2008 a nest was found attached to the side of a large hole at the base of a broken-off termite mound on Soda Plain; it was not possible to establish if the nest was active (S. Rooke *in litt.* 2008; Fig. 5). On 3 June 2010, in a village near Dida Hara, an active nest was found inside an old termite mound previously used as a bread oven by the villagers. The entrance to the mound was *c.*0.75 m wide at the base, 0.9 m in height, and shaped like a truncated triangle. The cavity inside was roughly 1×1×1 m, with a circular base and a domed roof. The nest was fixed to the roof of the dome (Fig. 6).

Nesting in termite mounds, which are presumably ancestral nesting sites for the species, is thus proven, but given the relative difficulty of locating these nests (unlike those in huts, they are not noticed by local people) it is impossible to judge if nesting in huts or termite mounds is more frequent. However, the abundance of huts across the species' range, the lack of occupation of termite mounds searched in 2014 in areas where the birds were nesting in huts, and the apparently low frequency of suitably sized cavities within termite mounds combine to suggest that hut nesting is much commoner.

Total White-tailed Swallow nest records now number 72: 62 in village huts, five in store huts, three in termite mounds, one in a remote water storage building and one in a well. Our nest records are from across the core of the species' range (Fig. 1), but there are still none from the Liben Plain. Visitors who locate further nests, particularly in termite mounds, are encouraged to send us details, including photographs and if possible GPS coordinates; any records away from the core range around Yabello and Mega will also be welcome.

Observations at the nest

In 2014 a detailed study of White-tailed Swallow nesting behaviour was conducted by AJB, JD, GD & MA, and the observations described here relate solely to the 23 nests involved. The 11 other nests found in 2014 were either inactive (five) or inaccessible (six—too high to inspect safely or further entry to hut was refused). In the case of inactive nests, the lining, presence of old eggs, and frequently the visiting or proximity of adults made us confident that all belonged to White-tailed Swallows. Nests were lined with grass and animal hair, and the eggs were pure white, as in Pearl-breasted (Schmidt 1959) and Pied-winged Swallows *Hirundo leucosoma* (Fry *et al.* 1992). This permits easy distinction from Ethiopian Swallow nests, whose eggs are speckled chestnut (Grant & Lewis 1984) (Fig. 7). In only one instance were a few feathers found in a White-tailed Swallow nest, whereas they are observed occasionally in nests of Pearl-breasted Swallow (Maclean 1993) and all ten Ethiopian Swallow nests found in 2014 were lined with chicken feathers. Clutch size was three in nine nests and four in ten (the other four were only seen at chick stage: two with four small chicks, one with two large chicks, and one with one large and one dead chick). Clutch size appears to be larger than in Pearl-breasted Swallow, for which two or three eggs are common but four is unusual (Fry *et al.* 1992, Maclean 1993).

Incubation period was 16–17 days (n = 5), as in Pearl-breasted Swallow (Schmidt 1959). In at least five nests, which were seen within the first two days after hatching, one chick had clearly hatched a day or two after the others, while in a further nine nests (first seen slightly later) the same notably small chick remained the runt throughout development, and often fledged a day

Figure 7. Comparison of nests of **(a)** White-tailed Swallow *Hirundo megaensis* and **(b)** Ethiopian Swallow *H. aethiopica*. White-tailed Swallows lay 3–4 pure white eggs in a simple grass- and hair-lined cup, while Ethiopian Swallows add a thick padding of feathers and lay 1–4 speckled eggs (mode = four) (Andrew Bladon)

Comparaison des nids de **(a)** l'Hirondelle à queue blanche *Hirundo megaensis* et de **(b)** l'Hirondelle d'Éthiopie *H. aethiopica*. L'Hirondelle à queue blanche pond 3–4 œufs blancs dans une simple coupe garnie d'herbes et de poils, tandis que l'Hirondelle d'Éthiopie ajoute une couche épaisse de plumes et pond 1–4 œufs tachetés (le plus souvent quatre) (Andrew Bladon)

or two later, if at all. This matches the asynchrony reported in Pearl-breasted Swallows (Schmidt 1959, Turner 2004). In the remaining nine broods no asynchrony was evident, suggesting that either it does not always occur or some catch-up growth can redress a size difference. This asynchrony and its absence were observed in both three- and four-egg broods, suggesting that it is unconnected to clutch size.

Breeding season

The main breeding season of White-tailed Swallows is April–June (Turner 2004) and the 23 active nests studied were found from early April to late May 2014, following the start of the wet season in March (JD, GD). When re-checked in June, none of these nests was active, suggesting that the birds do not lay a second brood. Several broods were found in early June in previous years (2010, 2011 and 2013), presumably because the wet season started slightly later (in 2013 it began in early April). In contrast, three of the ten Ethiopian Swallow nests were active again in June 2014, all three having been among the earliest Ethiopian Swallow nests to fledge their first brood, although none earlier than the first White-tailed Swallow nest to fledge. In addition, one White-tailed Swallow nest was lined with feathers and contained an Ethiopian Swallow brood. Intriguingly, this nest was in a hut which, although occupied, was in severe disrepair and intermediate in construction between the domestic huts favoured by White-tailed Swallows and the store huts favoured by Ethiopian Swallows.

In addition to the November 2007 and 2008 records (see above), two active White-tailed Swallow nests were found on 17 November 2012 at Derito, two in October 2013 near Dida Tuyura and Dadim, and three in October 2014 at Areri, Elwayaa and Dida Yabello (Fig. 1). The three 2014 nests all had eggs or chicks. These breeding attempts are presumably a response to the shorter wet season at this time of year (EWNHS 2001), and their distribution across different years and much of the range suggests that there is a second breeding season, although whether individual birds breed in both is unknown. However, two of the three October 2014 breeding attempts were in nests also used in May 2014, and the third was in a nest found in May when not active but did have two adult birds visiting, and which the villagers reported had been used during the previous rains. This suggests that the same pairs used the same nests in each of the two breeding seasons.

None of our 23 White-tailed Swallow nests was found to produce a second brood, whilst three of our ten Ethiopian Swallow nests did. It would appear, therefore, that some change in environmental conditions curtailed White-tailed Swallow's breeding window without affecting that of Ethiopian Swallow. This could reflect a difference in food sources. An alternative explanation is that, as temperatures rise from the wet season into the dry season, White-tailed

Swallow reaches the upper limit of its physiological capacity to breed, a possibility supported by the close match of White-tailed Swallow's range to a modelled climate envelope (Bladon *et al.* in prep.).

In contrast to White-tailed Swallow's single brood per breeding season, Pearl-breasted Swallow has two or even three (Schmidt 1959). Lindén (1988) found that in Great Tits *Parus major* the success of a second brood is negatively affected by the size of the first, favouring first brood reduction. The observed larger clutches of White-tailed compared to Pearl-breasted Swallow (Fry *et al.* 1992, Maclean 1993) might therefore be expected if White-tailed Swallow is only able to breed once per season, compared to Pearl-breasted Swallow's twice (Schmidt 1959). McGillivray (1983) noted that in House Sparrows *Passer domesticus* clutch size also increases when the adults' probability of survival until the next breeding attempt (which is a function of time between broods) is reduced. The time between White-tailed Swallow's April and October breeding seasons is greater than that between Pearl-breasted Swallow's first and second broods within a season, so again the larger clutch size in White-tailed Swallow might be expected.

Nest re-use

The same nests appear to be used over several years. A number of villagers in April–May 2014 informed us that the birds had nested in their huts previously. Three were reportedly new nests, two of which we observed in the process of construction, but another nest was two years old, two were three years old, and one was reportedly five years old (Fig. 4). Additionally one nest, active in both April and October 2014, was again active in April 2015 (S. Busuttil pers. comm.). Re-use of old nests occurs in Barn and Pearl-breasted Swallows (Møller 1990, Turner 2004), and evidence of this in White-tailed Swallows is further supported by the fact that active nests become blackened with carbon deposits from the hut fire, often with a noticeably paler, and therefore presumably newer, layer or two of mud at the top of the nest (Fig. 4). Colour variation and presence or absence of blackening of nests suggests that those in huts with fires visibly darken, and this should permit at least crude age estimation.

Nest re-use between seasons is perhaps a strategy to compress the breeding cycle. If the birds are limited to a shortened breeding season following each rains, with only time to produce one brood, then saving 2–4 weeks of nestbuilding (Schmidt 1959, Turner 2004) might significantly increase chances of success. Alternatively, it may permit the birds to breed even if there is a shortage of mud following a poor wet season. The simple grass and hair lining in White-tailed Swallow nests, and the preference for occupied huts with smoking fires, is perhaps a strategy to reduce parasite build-up between years which would otherwise hinder re-use of old nests (Møller 1990). The implication of this is that one or both pair members return to the same nest in subsequent breeding attempts, but the degree of nest-site fidelity in White-tailed Swallows awaits further research.

Behaviour at the nest

White-tailed Swallows appear well habituated to humans. They pay little attention to people entering nest huts, and will even 'squeeze' through a partially covered door to enter a hut full of people. Feeding rates by the pair can reach four or five times per minute, although occasionally the nest is not visited for up to 30 minutes (broods aged 8–14 days; AJB pers. obs.). When resting, adults often perch on the *Acacia* fences constructed by the villagers as cattle corrals, favouring those closest to their nest hut. Juveniles also frequent them post-fledging, while still being fed by their parents (Fig. 8). Several villagers reported that young birds continued to roost in the nest for up to six nights after fledging, although this was clearly not a rule as at least four broods did not return after fledging.

While attending the nest, males occasionally give a burry, hard but quiet *tetch*, apparently in contact. Once, at the nest in the old bread oven in 2010, a brisk, anxious, slightly sparrow-like *tsswis* was repeated rapidly but irregularly by the male when a dog was near the entrance to the cavity; this was evidently an alarm call. These two calls appear to be the first reported for the species.

Sex identification and juvenile plumage

Tail colour

As originally established by Benson (1942), males can be separated from females by the greater extent and brighter white in their tails. The amount of white in the tail is shaped

Figure 8. Post-fledging juvenile White-tailed Swallows *Hirundo megaensis* spend their first few days in the vicinity of the nest, often perching on *Acacia* fences while being fed (Andrew Bladon)

Les Hirondelles à queue blanche *Hirundo megaensis* juvéniles passent leurs premiers jours après leur sortie du nid dans les environs de ce dernier, souvent perchés sur des clôtures d'*Acacia* pendant leur nourrissage (Andrew Bladon)

by the extension of greyish-black fringes on individual rectrices (Fig. 9). However, in the field, individuals with less conspicuously white tails may also be juveniles. Late-stage nestlings and recently fledged juveniles have broad greyish-black fringes to their rectrices, producing a much darker overall appearance to their tails even than females. In particular, the innermost tail feathers (r1) are completely greyish black without any white. The other five pairs of rectrices have substantial white on their inner webs, while their outer webs and tips are greyish black. On the outermost rectrix (r6) the white is reduced to a smaller spot on the inner web (Fig. 9). This can make the in-flight separation of juvenile White-tailed and Ethiopian Swallows difficult.

Young birds studied in 2014 showed a marked difference in the development of white in the tail from day 16 onwards, and this was also noticeable in juvenile specimens. This could be individual variation, but might also reflect the sex of the birds.

Tail length

Sexes and age classes differ in tail length (Turner & Rose 1989) and furcation. In adult males at NHMUK, tails are longer than in adult females (mean = 60.4 and 53.5 mm, n = 4 and 1 respectively) owing to the extension of the outer rectrices, which leads to more pronounced furcation (mean = 23.1 and 14.0 mm). Pearl-breasted Swallow shows a similar sex difference in tail length (Benson 1949) and range of lengths (Maclean 1993). Size differences between the sexes are visible in the field, with male outer rectrices protruding beyond the tips of the folded wing, while in females these are shorter than the wingtips (Fig. 10). Tails of juveniles are even shorter than those of females (46.3 mm, n = 3) but do not seem to differ between the sexes.

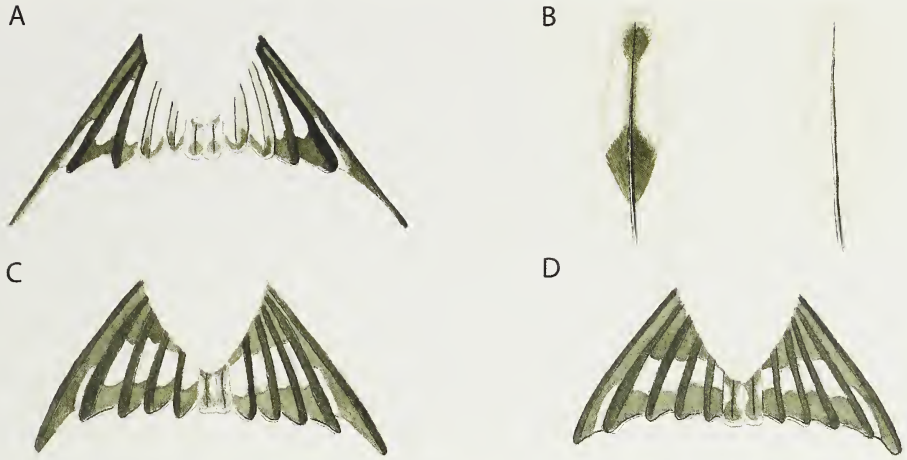

Figure 9. Variation in tail shape and coloration with age and sex of White-tailed Swallow *Hirundo megaensis*. **A:** male, showing a lot of white and long outer rectrices. **B:** variation in tail feather pattern between individual inner rectrices of different males. **C:** female, lacking streamers and with less white than the male, particularly in the inner rectrices. **D:** juvenile, similar to female with slightly smaller white patches and even shorter outer feathers (Stefanie Rick and Till Töpfer)

Variation dans la forme et la coloration de la queue selon l'âge et le sexe de l'Hirondelle à queue blanche *Hirundo megaensis*. **A :** mâle, avec beaucoup de blanc et des longs filets. **B :** variation dans le pattern des rectrices internes de différents mâles. **C :** femelle, sans filets et avec moins de blanc que le mâle, surtout sur les rectrices internes. **D :** juvénile, semblable à la femelle, avec des taches blanches un peu plus petites et des rectrices externes encore plus courtes (Stefanie Rick et Till Töpfer)

General coloration

While the different tail patterns are visible at reasonable distances in flying birds, we found it nearly impossible to distinguish the sexes by overall coloration. Redman *et al.* (2009) stated that females are duller than males, a fact we could confirm only under exceptionally favourable conditions, e.g. in pairs seen at close range perched next to one another (Fig. 10). It is too slight a difference to be useful in the field.

On the other hand, juveniles can be separated from adults in the field by the dull brownish head clearly contrasting with the glossy bluish-black back (Fig. 11), such that they could be mistaken for Grey-rumped Swallows *Pseudhirundo griseopyga*. As with tail coloration, there is marked individual variation in the extent of the gloss in juveniles, especially on the wings, which might be sex-related. In adults the head is the same glossy bluish black as the back and wings. Thus we can confirm 'immature browner' (Redman *et al.* 2009), but only with respect to the head and wings, as other differences in plumage gloss are hardly visible in the field.

Sociability

White-tailed Swallow is most frequently observed alone or in pairs, although groups of up to eight have previously been reported (Ash & Atkins 2009). When nesting, pairs are easy to find around the nest site, the frequency of visits suggesting they forage mostly near the village and its associated livestock. Elsewhere, singles and pairs can be encountered at any time, but like Pearl-breasted Swallow they are inconspicuous (Schmidt 1959) and typically disappear as quickly as they appear. They favour open grassland and less dense *Acacia* woodland, especially areas frequented by cattle herds or wild grazers. They are observed less commonly over *Commiphora*-dominated bushland, and do not occur among denser broad-leaved *Combretum–Terminalia* woodland, which contrasts with the broader range of habitats reported for Pearl-breasted Swallow (Turner 2004, Mellanby *et al.* 2008).

A number of sightings have also been made of larger, probably post-breeding flocks, which appear to contain a high proportion of immatures, and presumably occur in response to insect swarms on which the birds forage. Two favoured

Figure 10. Comparison of adult plumages of White-tailed Swallow *Hirundo megaensis*: **(a)** male; **(b)** female (Kai Gedeon)

Comparaison du plumage adulte de l'Hirondelle à queue blanche *Hirundo megaensis* : **(a)** mâle ; **(b)** femelle (Kai Gedeon)

sites are the Borana cattle ranch at Dida Tuyura, 15 km north-east of Yabello, and the Soda Plain immediately north of the Mega massif (Fig. 12). Both sites offer an open landscape with larger *Acacia* trees and frequent grazing herds. Flocks of up to 10–20 White-tailed Swallows were seen at both sites on a several occasions in the last hour of daylight in May–June 2013 and 2014. On one evening a mixed flock of White-tailed, Ethiopian and Barn Swallows was observed at Dida Tuyura, feeding 3–15 m above open ground, with up to 20 birds simultaneously resting in the canopy of two large trees. The numbers of each species were impossible to determine, but the total number of birds was at least 50. A similar, though smaller, mixed flock was also seen on the morning of 14 April 2014 on Dida Yabello plain.

However, flocking in these and other locations is not confined to evenings. A large flock of *c.*50 White-tailed Swallows, conceivably more, was present on a hot sunny afternoon on 3 June 2010 on the Soda Plain, hawking insects 5–20 m above ground and perching temporarily in the shaded outer subcanopy of two trees, on the opposite side from the sun. The trees held up to ten birds at any time, many of them juveniles. On the morning of 17 November 2012, another flock of *c.*50 White-tailed Swallows was seen *c.*30 m above open grassland on the main road south of Dubluk, near the village of Madacho. Within ten minutes they had all disappeared.

Figure 11. White-tailed Swallow *Hirundo megaensis* **(a)** nestling and **(b)** juvenile, with browner head and wings than the adult (*cf.* Fig. 10). Tail feathers of young birds have whitish fringes; the white windows on the inner webs of rr2–6 are concealed by overlying feathers (Kai Gedeon and Paul Donald)

Hirondelle à queue blanche *Hirundo megaensis* **(a)** oisillon et **(b)** juvénile, avec la tête et les ailes plus brunes que l'adulte (*cf.* Fig. 10). Les rectrices des jeunes ont des bords blanchâtres ; les fenêtres blanches sur les vexilles internes de rr2–6 sont cachées par les plumes superposées (Kai Gedeon et Paul Donald)

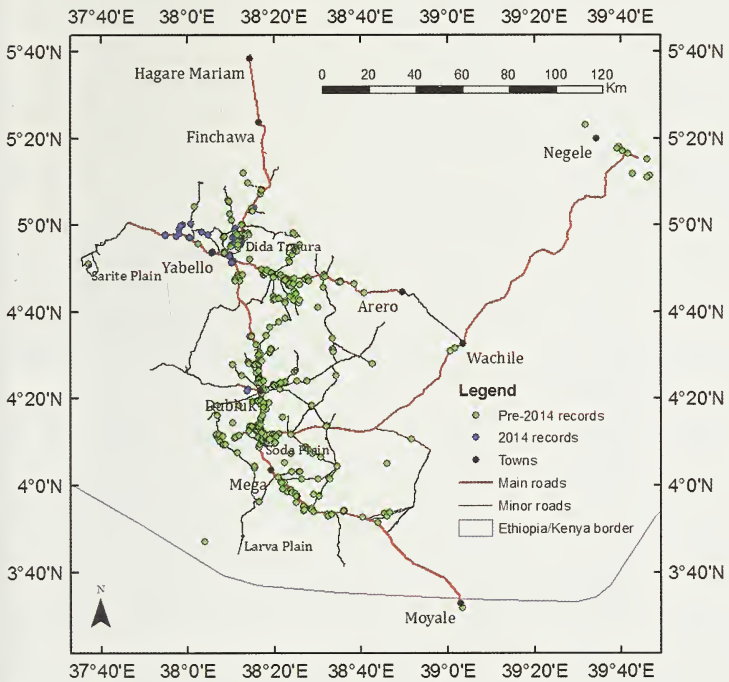

Figure 12. All White-tailed Swallow *Hirundo megaensis* records up to 2014 with available or derivable GPS coordinates (collected by the authors, with additional records from published sources mentioned in the text and others mentioned in the Acknowledgements). In 2014 the species was observed regularly west of Yabello for the first time.

Toutes les mentions de l'Hirondelle à queue blanche *Hirundo megaensis* jusqu'à 2014 avec des coordonnées GPS disponibles ou dérivables (collectées par les auteurs, avec des mentions supplémentaires de sources publiées mentionnées dans le texte et d'autres indiquées dans les Remerciements). En 2014 l'espèce a été observée régulièrement à l'ouest de Yabello pour la première fois.

Further sightings at Liben Plain

The occurrence of White-tailed Swallow on the Liben Plain, south-east of the town of Negele, was first reported by Gabremichael *et al.* (2009) (Fig. 12). Since then, other records have been made, summarised here. One was seen at the western edge of the Liben Plain on 23 May 2009 (M. Gabremichael pers. comm.). In February 2010, MW observed birds in an area of cleared scrub and ungrazed grassland in the south-east scrub/grass ecotone of Liben Plain, and at least five were at the same site on 5 June 2010 (MW, PFD, NJC). A single was seen a few km north of Negele on the road to Kibre Mengist, again in 2010 (S. Rooke pers. comm.). On 22 November 2012, PFD, YD & REG had two sightings of a single on opposite sides of Liben Plain. On 3 July 2013, YD observed two in the south-east of the plain, close to the area

used in 2010. Finally, a bird was reported in the area on 3 December 2014 (E. Williams *in Bull. ABC* 22: 104). Birds have also been seen once just west of the town of Wachile and at nearby Melka Guba (M. Gabremichael pers. comm.), halfway between Mega and Negele.

The frequency of sightings from Liben Plain, covering all but one year in 2005–14 and across eight months (October–February and May–July), show that the species occurs regularly in the area. It is unclear, however, if these birds represent a resident breeding population (seven immatures were seen on 31 October 2006: Gabremichael *et al.* 2009) or if there is movement between the core range and the Plain. Lone sightings at Sarite Plain (Syvertsen & Dellelegn 1991), Larva Plain (Ash & Atkins 2009) and near Moyale (Thouless 1996) suggest that some wandering occurs, which is perhaps unsurprising for a hirundine (Fig. 12). The records from Wachile may be the first evidence of birds moving between Yabello/Mega and Negele, or an indication that the species occurs continuously between the two sites but remains undetected owing to the species' low density and lack of survey time. Observers in these areas are encouraged to be vigilant, and to report any records with as much supporting information as possible.

Conservation

Traditional Borana huts clearly provide an important nesting site for White-tailed Swallow, which appears not to utilise larger, more modern buildings, unlike Pearl-breasted Swallow (Maclean 1993). This may be due to displacement by larger hirundines (Harrison *et al.* 1997), but it certainly cannot be attributed to a lack of tolerance of human disturbance, which may affect other species (Turner & Rose 1989). Across the range, the maintenance of traditional houses, with thatched roofs and loose door assemblages, is clearly important for breeding success. Community engagement is also important with respect to recognition of the birds. Mistaken identification as bats can lead to nest destruction, so initiatives by the national park authority to raise awareness of the species may assist conservation efforts.

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